**Remarks**

This response is being filed under 37 CFR 1.31. A new power of attorney will be filed shortly.

The claims have been amended to take into account the comments raised on the Final Action mailed 06/19/2006, both with respect to added subject matter and the prior art.

New independent claims has been added bringing the total number of independent claims now to 5. Accordingly, the appropriate additional claims fee for one extra independent claim has been paid with this electronically submitted response. The Director is authorized to charge our deposit account no. 13-1717 for any additional fees that may be required.

Claims 1 to 12 have been cancelled and thus are no longer an issue.

The limitation "said packet-ordered fixed length cell" has been removed from claim 13, as has the reference to the reassembly queues corresponding to a destination address. The reassembly queues actually correspond to different ingress flows (see passage at the foot of page 14), where ingress flow in this context means the traffic flow to an ingress card. In one aspect of Figure 4A an ingress traffic flow to a particular ingress card is split into multiple segmentation queues generating multiple traffic flows, but these are all sent to the same reassembly queue in the egress card.

In accordance with the various aspects of the present invention, incoming packets are segmented into cells and transported through the switch fabric on a cell by cell basis. While some ordering, as described with reference to Figure 4, may be desirable at the ingress side, the cells will generally become interleaved as they pass through the cell fabric because cells originating from packets in different ingress flows will intermingle within the switch.

The result is that as shown in both Figure 3B, which represents the prior art, and Fig. 4B(ii), which represents an embodiment of the invention, the cells emerging from the switch fabric are intermingled.

The prior art technique for dealing with this situation is shown in Figure 3B. The cells associated with different cell packets are directed to different reassembly queues

associated with each cell packet, where the cells become packet ordered as they are sent to the reassembly queue for that particular packet. This solution is very resource intensive because a large number of reassembly queues are required just to handle different cell packets that belong to the same traffic flow.

In an aspect of the invention, unlike the prior art, particular represented in claim 25, the reassembly queues are associated with the different ingress flows, generally corresponding to different ingress cards, although they can correspond to different priorities within the same ingress card. If the arriving packets were simply assigned to the reassembly queue associated with a particular ingress flow, it would not be possible, without further hardware, to easily reassemble the packets because the cells would not be stored in the reassembly queues in an order corresponding to the cells packets. In accordance with this aspect of the invention, reflected in new claim 25, the cells are ordered on a cell-by-cell basis as they arrive at the reassembly queue associated with the ingress flow carrying the corresponding incoming packet. Thus, simply by combining the adjacent cells (and stripping the headers as appropriate) it is possible to reassembly the packets of the ingress flows without requiring multiple reassembly queues for each ingress flow. A substantial savings in hardware resources is thus achieved. All this is explained with reference to the embodiment of Figure 4starting at line 14, page 15.

Now if we look at the cited Endo patent, it attempts to achieve a similar result, but in an entirely different manner. Endo is entirely based on scheduling of groups of cells, which avoids interleaving of the individual cells in the switch. In the Figure 1 embodiment, the cell switch 62 (see col. 7, line 35) sets up the path through the switch and "transmits the cells continuously after setting up the path. During this cell switch does not transit any cell to be transmitted from the other input interfaces to the output interface." In this embodiment, each output interface only has one reassembly queue and can only accept one traffic flow at a time, which considerably restricts the efficiency of the resource.

In the invention, by contrast, each output interface has a reassembly queue corresponding to each ingress flow, and contrary to Endo's Figure 1 embodiment, multiple ingress flows can pass simultaneously through the switch to the same output interface. No scheduler is employed. Unlike Endo, the cells thus become interleaved as they pass through the switch (see Figure 4b(ii)). If the cells of the present invention exiting the switch were directed to

the reassembly queue in the manner described in Endo, they would arrive in the reassembly queue in an unordered manner, and thus could not be easily reassembled. The additional feature offered by the invention is that the interleaved cells coming from the switch are directed into a reassembly queue associated with a particular ingress flow, where they are re-ordered into the proper sequence so that the can be easily be re-assembled into multiple packets simply by combining groups of contiguous cells.

The Examiner refers to the passage starting at col. 7, line 53 as suggesting that the Endo teaches simultaneous transmission for multiple streams. However, this passage makes it quite clear that the cell switch may only transmit a packet to "an output interface different from the output interface." The switch performs the transmission in parallel using "different paths" (see col. 7, line 54) so there is no question of the packets to the same output interface (egress card) from different input traffic flows becoming interleaved as in the present invention.

The embodiment in Figure 1, which transmits the cells of each "packet cell" sequentially to the output interface without the possibility of transmitting cells from other input flows to the same interface is therefore quite different from the present invention, and less efficient because the packet flows to the same interface have to be scheduled sequentially.

The Examiner then turns his attention to Figure 7. In this embodiment of Endo, the packets are wrapped in containers, and the containers are transported through the switch fabric as complete entities in a manner determined by the scheduler 1. For example, interface 4-1 has multiple queues 21-1-1, 21-1-2, and 21-1-n corresponding to the interfaces 3-1 to 3-n. To this extent, Figure 7 bears some similarity with an embodiment of the present invention. But this is where the similarity stops.

To see how Figure 7 works, we first have to look at Figure 3, where there is only one queue for each output interface. In Figure 3, each input interface has n queues corresponding to the respective output interfaces, and the scheduler then permits each of the interfaces to transmit a container, which contains a number of cells, to a specific output interface. The containers are transmitted as a whole by the scheduler. No interleaving of the cells takes place during transit of the containers through the switch. Each container is merely placed in its appropriate output queue, and since all the cells were transmitted together, it is easy to extract the packets.

The only difference between the Figure 7 embodiment and the Figure 3 embodiment is that each output interface has *n* queues corresponding to the *n* input interfaces, but the containers are still sent through the switch sequentially to the same interface under the control the scheduler 1. There is no interleaving of the cells passing through the switch fabric, and no re-ordering of the cells as they emerge from the switch fabric. For example, scheduler 1 might send a container load of cells from input interface 3-1 to queue 21-1-1 of output interface 4-1, followed by a container load of cells from input interface 3-n to queue 21-1-n of output interface 21-1-n. The complete containers arrive at the corresponding output queues without any interleaving of the cells occurring as arises in the present invention. One input interface cannot send its container to a particular output interface until after the preceding container from another input interface has been sent.

In accordance with an aspect of the present invention, the cells from different ingress flows (different ingress cards) can be sent without waiting for a complete cell packet from another ingress card to be sent because of the way in which the individual cells are ordered and assigned as the come out of the switch fabric interleaved with each other.

In an embodiment of the invention, shown in Figure 4B(i), the cells from the same ingress card 402A are sent sequentially as not to be interleaved, but these cells can be interleaved with cells from other ingress cards, such as 402B during passage through the switch.

In yet another embodiment, shown in Figure 5, the different traffic flows can result not from different ingress cards, but rather from different classes of service residing on the same ingress card, rather than different ingress cards. The language of claim 13 has been chosen to cover both these aspects of the invention.

It is believed that the present invention, which permits interleaving of the cells transported through the switch to the same interface, is fundamentally different from the technique employed in Endo, wherein the cells or containers are transported sequentially to the same interface without any possibility of the cells becoming interleaved in the switch fabric.

Accordingly, reconsideration and allowance are respectfully requested.

Respectfully submitted,

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